Q-343R5

SVE BULLETIN

SPECIAL VEHICLE ENGINEERING – BODY BUILDERS ADVISORY SERVICE

E-Mail via Website: www.FordBBAS.com (click "Contact Us")

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QVM BULLETIN: Q-343R5 DATE: 06SEPTEMBER2022

COMMERCIAL BATTERY ELECTRIC VEHICLE (BEV) PLAYBOOK FOR SHIP THRU UPFITTERS AND DROP SHIPS

REVISION	UPDATE	REVISION DATE
Q-343-R5	(BEV) Playbook for Ship Thru Upfitters & Drop Ships Ver. 1.3 Updated Text and Nomenclature	07JULY2022
Q-343-R4	(BEV) Playbook for Ship Thru Upfitters & Drop Ships Ver. 1.2 Updated Text and Nomenclature	05MAY2022
Q-343-R3	(BEV) Playbook for Ship Thru Upfitters & Drop Ships Ver. 1.1 Updated Torque, Range, Images	18JFEB2022
Q-343-R2	Commercial Battery Electric Vehicle (BEV) Playbook for Ship Thru Upfitters & Drop Ships Ver. 1.0	07JAN2022
Q-343-R1	Updated Charging Station Information	08OCT2021
Q-343	INITIAL RELEASE	22OCT2021

MODEL(S) AFFECTED:

E-Transit, F-150 Lightning Pro, Mustang Mach-E, and Future Battery Electric Vehicles (BEV) Offering

ISSUE / DESCRIPTION:

Please review the following pages enclosed for "Commercial Battery Electric Vehicle (BEV) Playbook for Ship Thru Upfitters & Drop Ships" guidance focused on charging infrastructure requirements, options and considerations and share with all appropriate departments and employees.

Preproduction computer-generated image shown.

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Commercial Battery Electric Vehicle (BEV)

Playbook for Ship Thru Upfitters and Drop Ships

NOTE: Version 1.4 – Released September 2022

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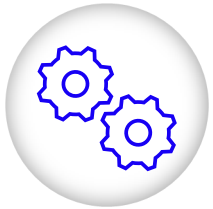
Commercial Battery Electric Vehicle (BEV) Product Line Up Overview



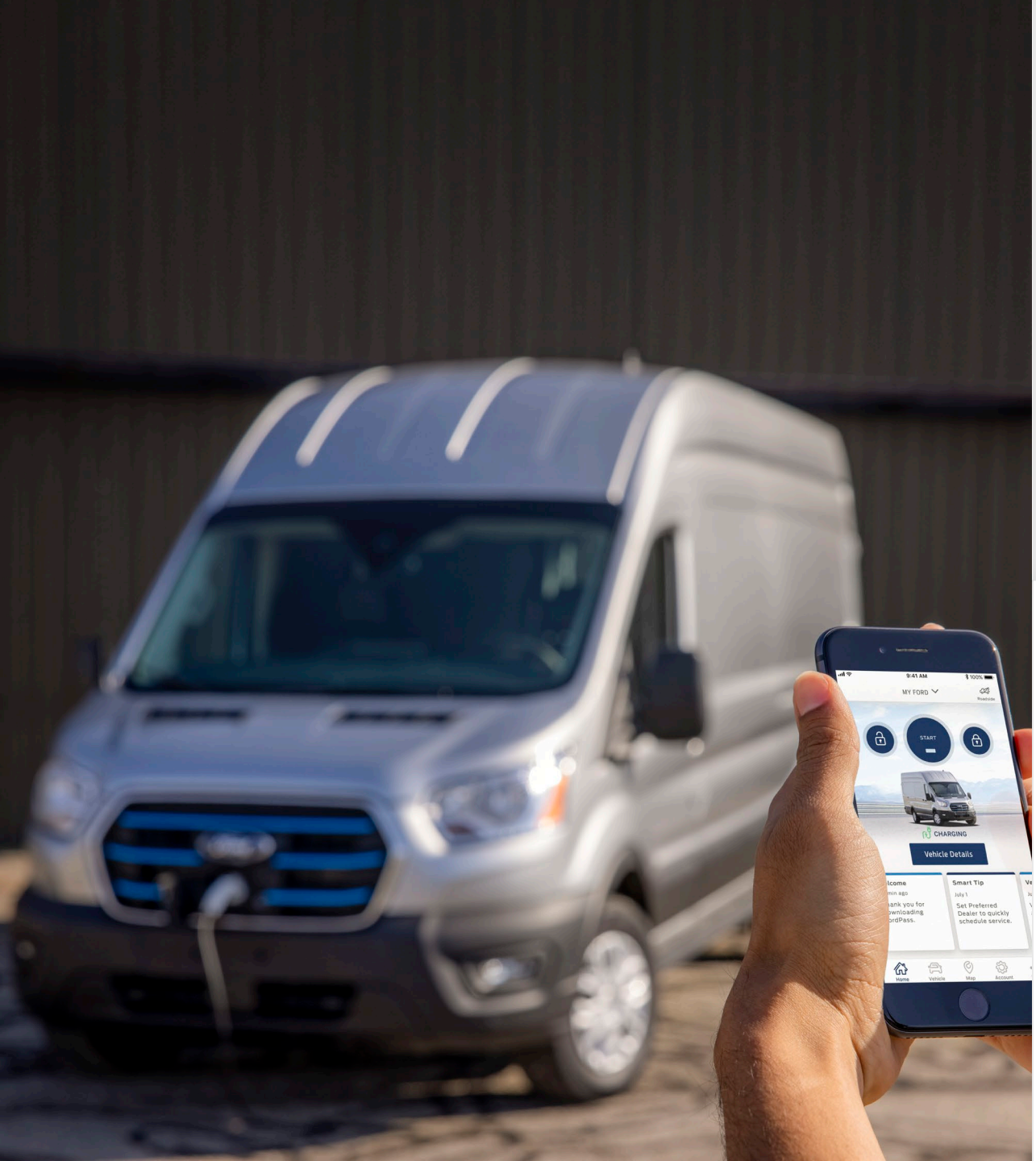
Operational Preparedness

- Safety
- Modification / Upfit Considerations
- Processing / Handling / Delivery
- Off Plan Issues

Charging & Electrification

- Charging
- Electrification Planning
- Electrification Implementation

Resources & Contacts



As we work together to support our customers wanting to place E-Transit, F-150 Lightning and other future Battery Electric Vehicle (BEV) / Plug-in Hybrid Electric Vehicle (PHEV) orders, vehicles with new handling and operational requirements will be moving through the order to delivery process.

The goal of this guide is to assist our partners in ensuring a smooth customer-friendly delivery handoff to end customers, along with a smooth vehicle flow through all possible steps prior to the handoff as well.

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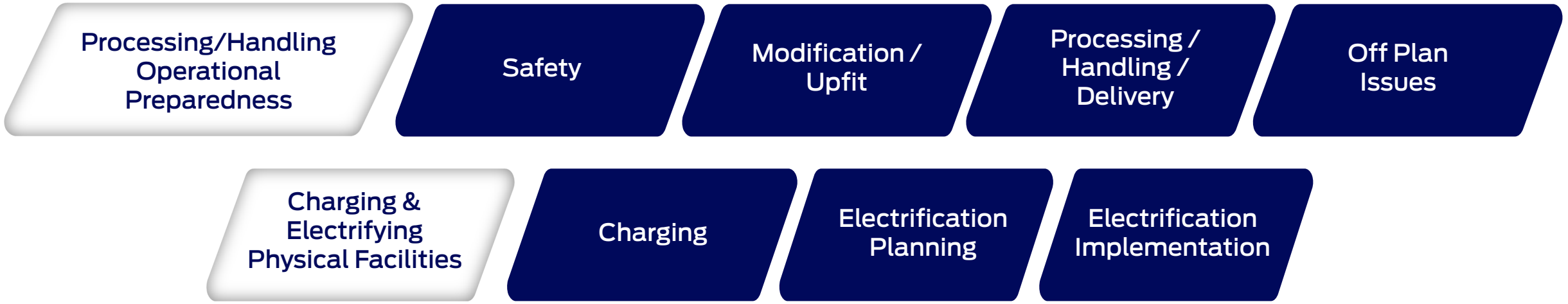
Becoming “BEV Capable”

Ship Thrus and Drop Ships handling BEVs will need to ensure they are “BEV Capable.”

- Providing necessary information on vehicle operation / handling to all staff members who will be operating and handling BEVs
- Developing and implementing plans to establish charging infrastructure at any facility that will be handling, processing and/or performing pre-delivery inspection (PDI) for BEVs



Product Overview

Preproduction computer-generated image shown. Available early 2022.

Introducing the E-Transit

- Ford has been America's best-selling commercial vehicle brand for 36 years* because of our Built Ford Tough durability, and that continues with E-Transit
- Powered by a 68 kWh** Lithium-Ion battery pack, single speed transmission and 266 hp RWD electric motor producing 317 lb-ft of torque***, E-Transit is ready for work
- Battery is neatly packaged in the underbody of the vehicle -- no compromise to cargo capacity
- Full-size spare helps avoid costly down time in case of tire damage

*Based on HIS Markit CY1985-2020 US TIPNet Registrations excluding registration to individuals. TIP registration prior to 2010 do not include GVW 1 and 2 vehicles.
**Based on manufacturer calculation using computer engineering simulations. Your results may vary.
***Calculated via peak performance of electric motor(s) at peak battery power. Your results may vary. Horsepower and torque are independent attributes an may not be achieved simultaneously.

Key E-Transit Specs

Purpose-Built Targeted Range*

- Low Roof – 126 Miles
- Med Roof – 116 Miles
- High Roof – 108 Miles

Uncompromised Capacity

- Up to 487.3 cubic feet of Cargo Space Inside High-Roof
- Extended Wheelbase

Power to Get the Job Done

- 266 HP / 198kw of Power
- 317 lb.-ft. of Torque
- 2.4kW Pro Power Onboard

Capability

- Targeted Max Payload
- Cargo Van 3,880 lbs.
- Chassis Cab 4,380 lbs.
- Cutaway 4,428 lbs.

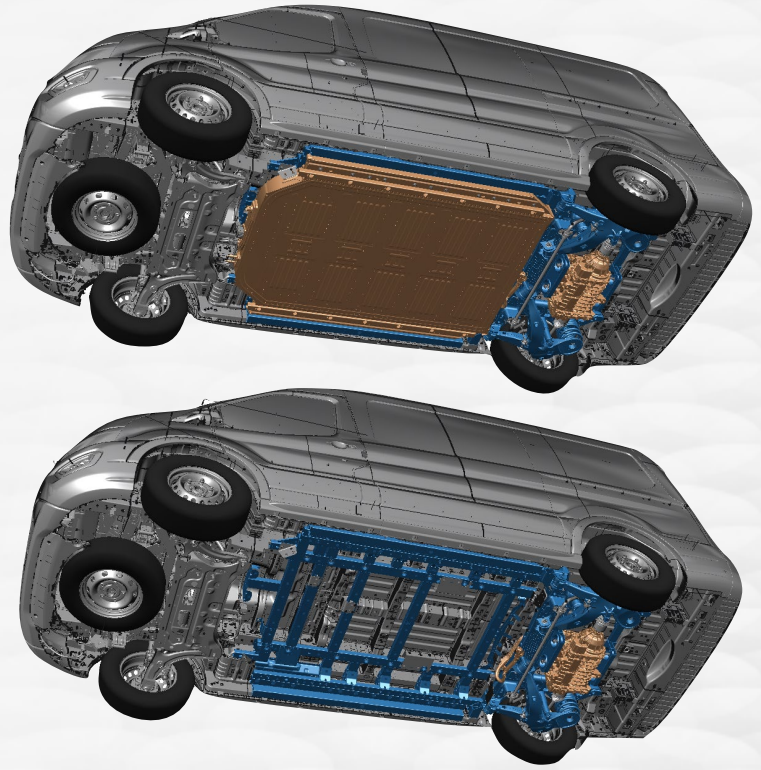
Peace of Mind

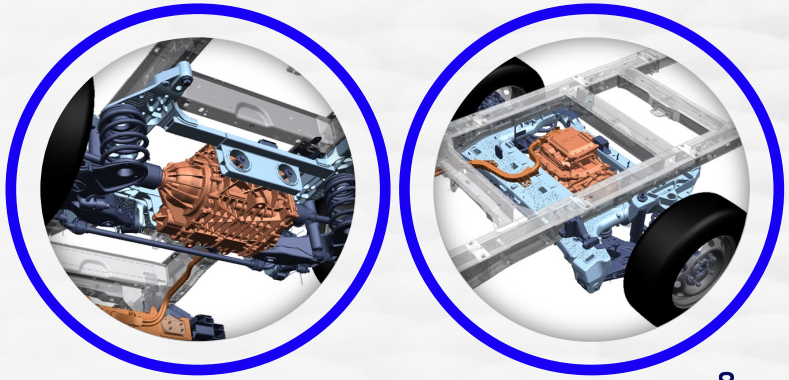
- 8-Year, 100K Mile EV Component Warranty

*Based on a full charge. USA targeted range reflecting current capability based on analytical projection consistent with US EPA MCT drive cycle methodology. (www.fueleconomy.gov/feg/pdfs/EPAtestprocedureforEVs-PHEVs-11-14-2017.pdf). Actual range varies with conditions such as external elements, driving behaviors, vehicle maintenance and lithium-ion battery age.

E-Transit Underbody Layout

- Rear Primary Drive Unit (electric motor plus single speed transmission) in subframe, single rear wheel only
- Integrated Inverter System Controller (ISC)
- Independent coil spring rear suspension
- Central battery pack in sealed structural box
- Battery support cradle and perimeter structure
- Spare wheel in the front (except EL Van)





Introducing the F-150 Lightning

Distinctive design and utility in a familiar package

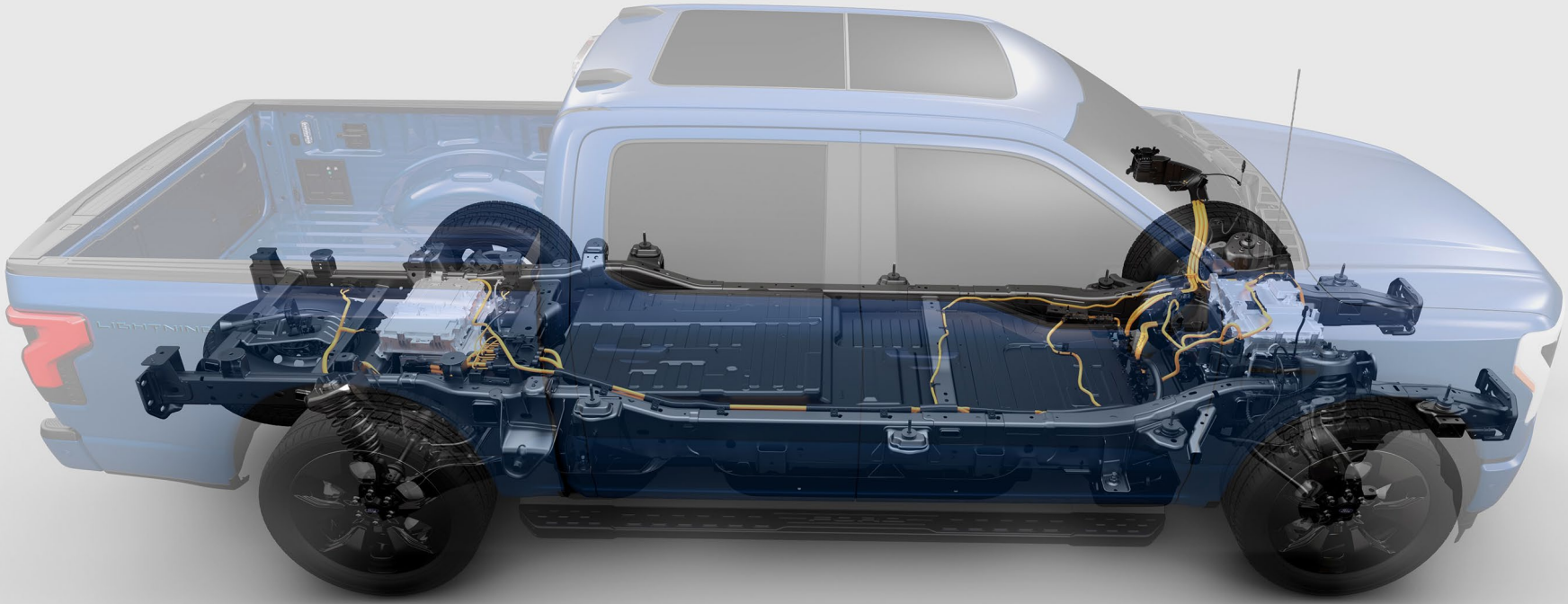
The future of fleet electrification is here – and F-150 Lightning combines forward-thinking technology with battery placement that doesn't compromise cabin or cargo space.

Electrification Upgrades

As part of its 4×4 dual electric motor propulsion, F-150 Lightning also features:

- A choice of standard or extended-range batteries
- A purpose-built frame that enables a low center of gravity
- Space for the high-voltage battery that preserves all the usable space of a gas-powered F-150
- EV-specific independent rear suspension
- Smooth, powerful acceleration for an improved driving experience
- The most torque ever offered in an F-150
- Enhanced underbody protection

Preproduction computer-generated image shown. Available starting spring 2022.



New to F-150 Lightning Exterior

- Front Bumper, Grille, Fascia, Hood, Fenders
- New LED Headlamps w/Signature Light Bar
- New Box Outer Fenders, Tailgate
- New LED Taillamps w/Signature Light Bar
- New Unique Wheels (18”, 20”, 22”)
- New Aerodynamic RB w/EZL

5.5 Foot Box Shown

Exterior Carry-Over From Super Crew

- 4 x 4
- Common Crew Cab
- 5.5 ft Bed Inner Dimensions
- Rear Bumper

Key Technical Specifications

POWERTRIAN / DRIVETRAIN	Standard Range Battery	Extended Range Battery
Drivetrain Layout	Dual eMotor, (front/rear transverse mounted, four-wheel drive)	
Motors/Configuration	Two inboard three-phase fixed magnet AC motors with internal PMAC controller and trans axles	
Targeted Peak Power (hp/kW)*	426/318	563/420
Targeted Peak Torque (lb.-ft.)*	775	775
Motor Build Location	Van Dyke Transmission Plant	

**Calculated via peak performance of the electric motor(s) at peak battery power. Your results may vary. Horsepower and torque are independent attributes and may not be achieved simultaneously.*

BATTERY/ENERGY STORAGE	Standard Range Battery	Extended Range Battery
Battery Type	Dual eMotor, (front/rear transverse mounted, four-wheel drive)	
Onboard charger power (input/output)	11.3 kW/10.5kW	19.2 kW/17.6 kW
Battery assembly location	Rawsonville Components Plant	
EPA-Estimated Range*	230	320

**Excludes Platinum models. Based on full charge. U.S. EPA range based on manufacturer computer engineering simulations and EPA-estimated range calculation methodology. Actual range varies with conditions such as eternal environment, vehicle use, vehicle maintenance, lithium-ion battery age and state of health. Horsepower, torque, and EPA Estimated Fuel Economy Ratings are independent attributes and may not be achieved simultaneously.*

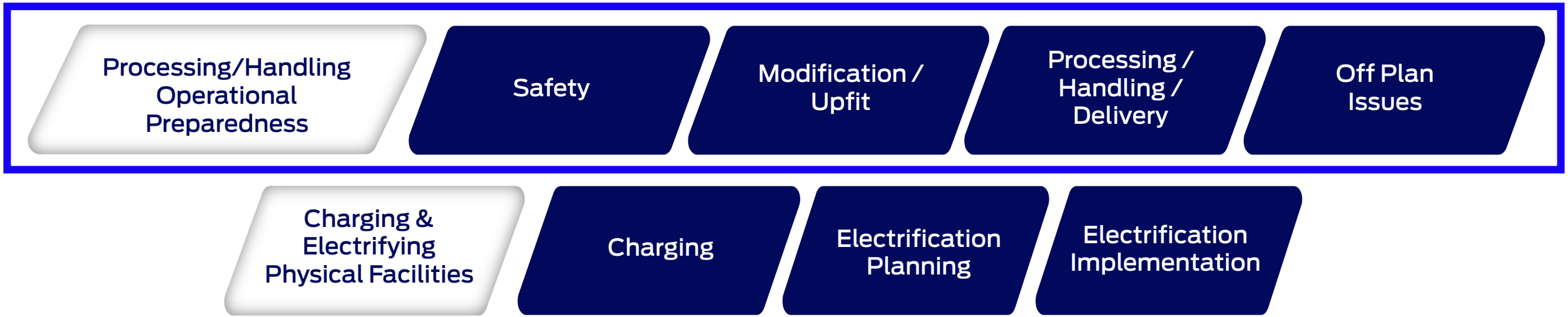
Get To Know the 2022 Mustang Mach-E

For 2022 – Targeted EPA Range has increased on Select, Premium, and California Route 1 Models

More than a statement –head-turning design, dynamic performance and forward-looking technology in an electrified SUV. Plus, targeted EPA range of 314 miles. *

- 10.2" digital instrument cluster screen
- 15.5" center-stack color touchscreen
- 29.7 cu. ft. of cargo space behind the second-row seats**
- 59.7 cu. ft. of cargo space behind the first-row seats**
- Mustang-inspired styling
- Targeted EPA-estimated ranges from 234 miles to 314 miles*
- Ford Co-Pilot360TM Technology
- Frunk with 4.7 cu. ft. of storage**
- Intelligent Adaptive Cruise Control with Speed Sign Recognition
- Pony projection lamps
- Seating for five
- SYNC® 4A with Enhanced Voice
- Recognition and Connected Navigation
- Models: Select, California Route 1, Premium, GT
- Three selectable Drive Experiences
- Wireless charging pad[3] for compatible phones
- Access to nationwide Ford BlueOval™ Charging Network of public chargers
- Active Park Assist 2.0
- All-wheel drive (eAWD)
- Charging equipment: standard Ford Mobile Charger (cord) and available Ford Connected Charge Station (wall unit)
- DC Fast Charge capability
- E-Latch push-button door openers
- Software Updates
- Phone As A Key
- Reverse Brake Assist
- Rotary gear shift dial
- BlueCruise "hands-free" driving technology***

*Based on a full charge when configured with optional Extended-Range Battery and rear-wheel drive. Targeted range varies with conditions such as external environment, vehicle use, vehicle maintenance, lithium-ion battery age and state of health. Final EPA-estimated ratings available in fall of 2021. **See Owner's Manual for exact details. ***Driver-assist features are supplemental and do not replace the driver's attention, judgment and need to control the vehicle. Ford BlueCruise is a hands-free highway driving feature. Only remove hands from the steering wheel when in a Hands-Free Blue Zone. Always watch the road and be prepared to resume control of the vehicle. It does not replace safe driving. See Owner's Manual for details and limitations. Requires purchase of three-year connected service plan with regular map updates, FordPass™ App and modem activation.



Becoming “BEV Capable”

Safety Information

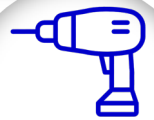
Disconnect high-voltage system when conducting work on or near battery, high-voltage cables and other components

See Workshop Manual and Owner's Manuel for directions

High-Voltage Systems

Large battery located underneath vehicles

Pay close attention to drill zones indicated in modifier guides to ensure safe modification practices



Drilling Near Battery

Take caution when lifting vehicle on jacks due to battery location underneath vehicles

See Workshop Manual for more information on how to safely lift vehicle

Lifting Vehicle

Take caution when welding on the vehicle, particularly in areas near the battery or high-voltage systems

Consult Workshop Manuals and Modifier Guides for information around appropriate tools and practices for welding

Welding

Review Emergency Response Guide to ensure familiarity with appropriate actions

Call emergency personnel iimmediately in the event of a fire

Fires

What aspects of upfitting/ handling may require special attention for safety?

Document	Publish Date		
	Mustang Mach-E	E-Transit	F-150 Lightning
Vehicle Owner's Manuals	Available Now	Available Now	Available Now
Modifier Guides	Available Now	Available Now	Available Now
Workshop Manual	Available Now	Available Now	Available Now
Emergency Response Guides / Rescue Cards	Available Now	Available Now	Available Now

Modification / Upfit

Resources to Consult When Preparing for BEV Upfits

Upfit Reference Guides
Including body builder layout books and other technical specification documents

CLICK HERE

Fleet Vehicle Guides
Including battery removal guides, emergency response guides, and modifier guides

CLICK HERE

Questions?
Call for additional support related to modifications, contact the body builders advisory service (BBAS)

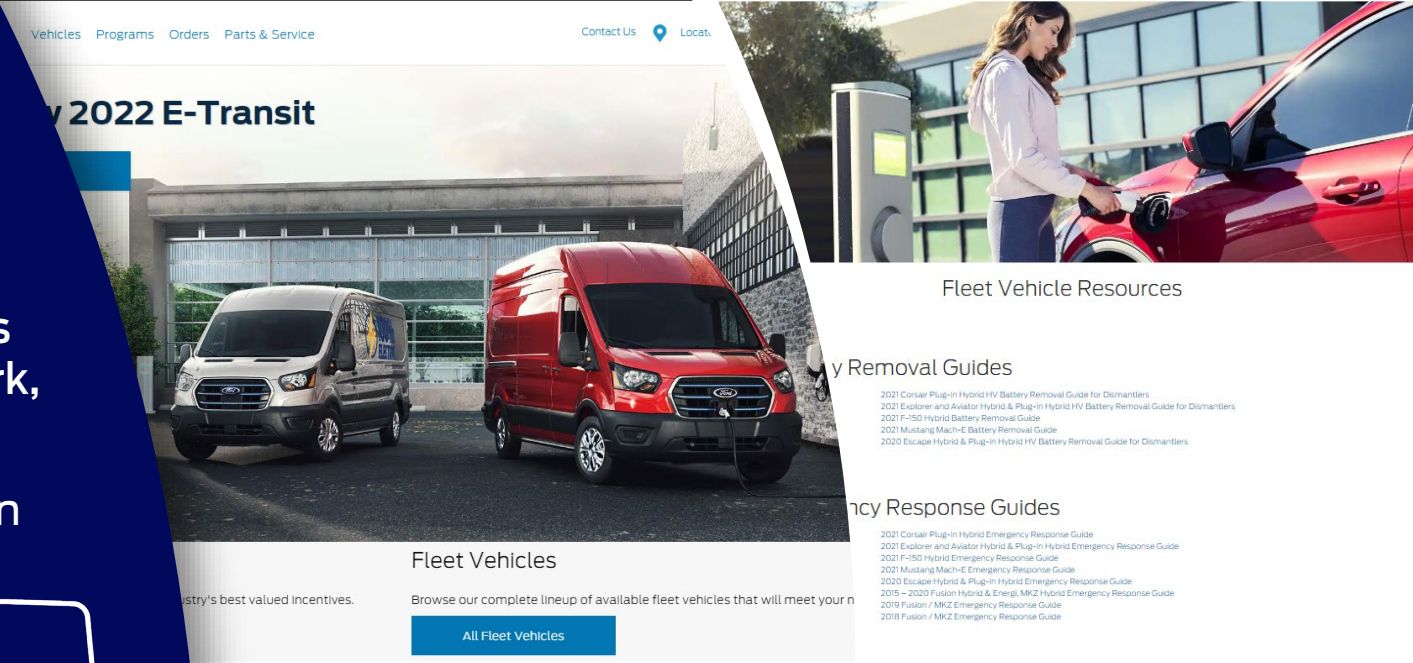
877-840-4338 or 313-748-9080

IMPORTANT:
Please review the Ford Body Builder Advisory Service website (fordbbas.com) for the latest information on modifying any Ford BEVs in addition to the valuable resource listed below.

BEV Training & Info

- Ford Customer Service Division (FCSD) develops training and deploys it to the Ford Dealer Network,
  - Information for obtaining training is provided through links in Body Builder Layout Books & on www.motorcraftservice.com

- Hybrid Vehicle / BEV Safety Training for Ship Thru Upfitters[1]:
- Access for Upfitters With No FIN Code via https://www.motorcraftservice.com/Product/Training/2
- Access for Upfitters With FIN Code (Pool Accounts & alike) via https://www.fleet.ford.com/parts service/support/technical-training/
- Ford Tool Resources via https://rotunda.service-solutions.com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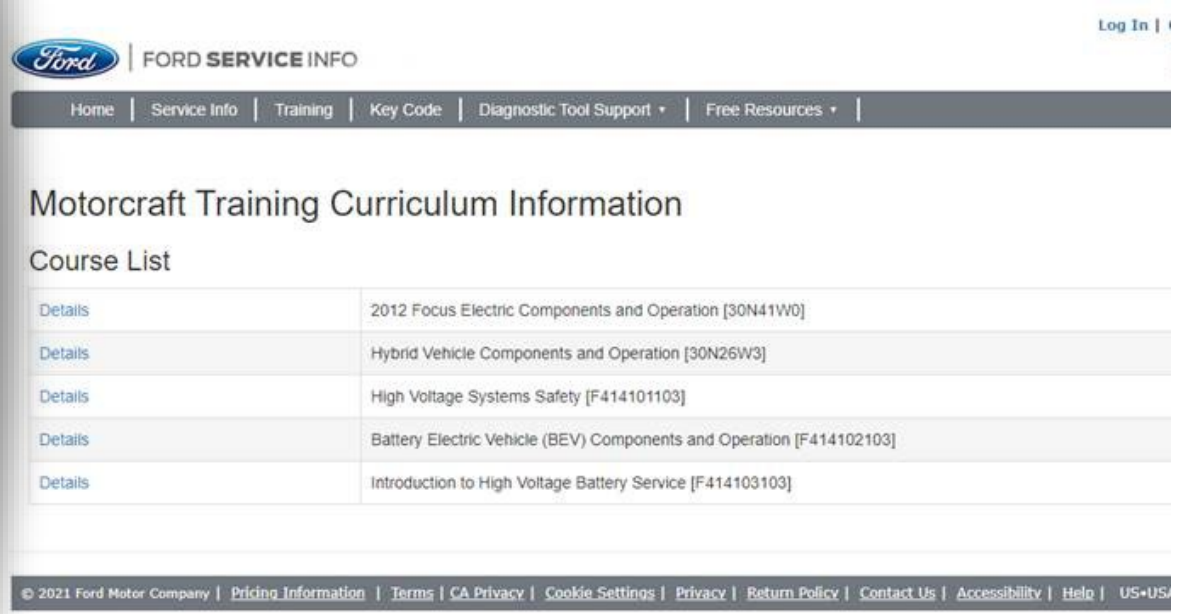
2022 E-Transit
Fleet Vehicles
Browse our complete lineup of available fleet vehicles that will meet your n
All Fleet Vehicles
Fleet Vehicle Resources
y Removal Guides
2021 Corsair Plug-In Hybrid HV Battery Removal Guide for Dismantlers
2021 Explorer and Aviator Hybrid & Plug-In Hybrid HV Battery Removal Guide for Dismantlers
2021 F-150 Hybrid Battery Removal Guide
2021 Mustang Mach-E Battery Removal Guide
2020 Escape Hybrid & Plug-In Hybrid HV Battery Removal Guide for Dismantlers
ncy Response Guides
2021 Corsair Plug-In Hybrid Emergency Response Guide
2021 Explorer and Aviator Hybrid & Plug-In Hybrid Emergency Response Guide
2021 F-150 Hybrid Emergency Response Guide
2021 Mustang Mach-E Emergency Response Guide
2020 Escape Hybrid & Plug-In Hybrid Emergency Response Guide
2015 – 2020 Fusion Hybrid & Energi, MKZ Hybrid Emergency Response Guide
2019 Fusion / MKZ Emergency Response Guide
2018 Fusion / MKZ Emergency Response Guide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Course List
Details | 2012 Focus Electric Components and Operation [30N41W0]
Details | Hybrid Vehicle Components and Operation [30N26W3]
Details | High Voltage Systems Safety [F414101103]
Details | Battery Electric Vehicle (BEV) Components and Operation [F414102103]
Details | Introduction to High Voltage Battery Service [F414103103]
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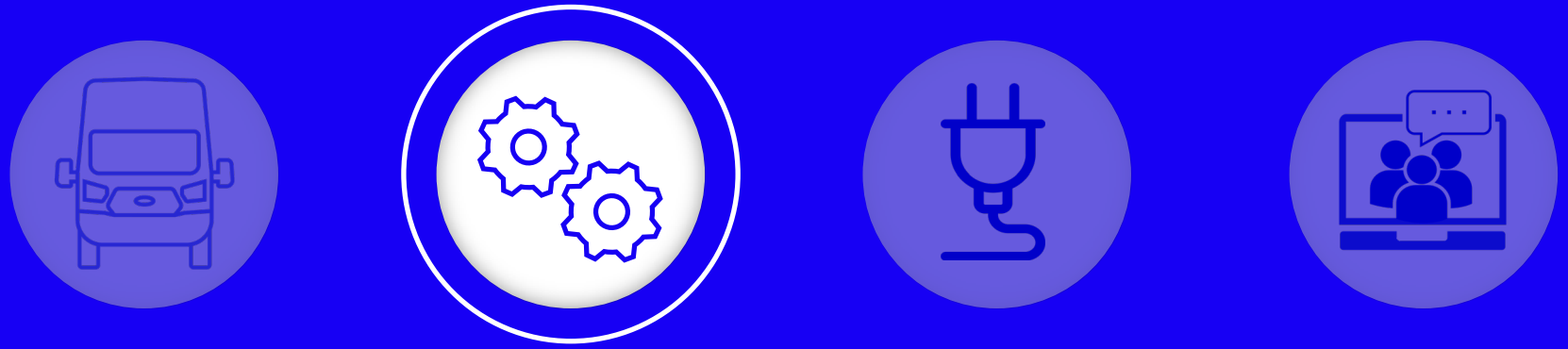
[1] *Note that access to training requires membership signup.*

Processing / Handling / Delivery



Ship Thru Upfitters – Storage Guidance

- Process and perform modifications how you normally would in accordance with standard upfit practices
- Note the modification/upfit and safety considerations as previously stated
- Certain instructions should be considered for managing vehicles' high-voltage battery State of Charge (SOC) and 12V low-voltage battery life

	Short-Term Storage: < 30 Days (< 30 Days)	Long-Term Storage: 30+ Days (30+ Days)
Keep Vehicle Plugged In?	No	No
State of Charge to Maintain on High-Voltage Battery?	Keep at SOC level received If received < 20% SOC, charge up to 40% SOC until prepping vehicle to leave compound[1]	Keep at 20-40% SOC[1]
Start Vehicle Periodically to Preserve 12V Battery Life?	Not Necessary	Not Necessary
Steps to Ensure High-Voltage Battery SOC Over Long Inactive Periods and Preserve 12V Battery Life	Keep 12V Battery Connected	Disconnect 12V Battery During Storage Period to Avoid Draw on High-Voltage Battery SOC

Factory Mobile Power Cord

Belongs to the customer and is NOT TO BE USED in the processing of any BEV – must be left unopened

See later "Charging Section" for information on how to charge and factors that affect SOC

[1] To learn how to schedule charging times and set upper limits on the amount of desired charging, please see the appropriate owner's manual.

Ship Thru Upfitters – Final Prep Before Vehicle Release

Prepping vehicle for leaving Upfitter

1 If headed to a Dealer/Drop Ship for final prep[1]

Mustang Mach-E

Standard Range Battery → Charge up to 55% or higher
Extended Range Battery → Charge up to 45% or higher

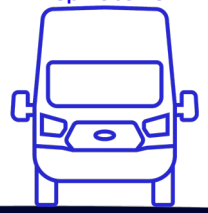
E-Transit (Van/Cutaway/Chassis Cab)

Charge up to 65% SOC or higher

F-150 Lightning

Standard Range Battery → Charge up to 45% or higher
Extended Range Battery → Charge up to 40% or higher

Headed to Final Prep Location



2 If conducting pre-delivery inspection (PDI)

- See next slide for SOC guidance

PDI

Factory Mobile Power Cord

Belongs to the customer and is not to be used in the processing of any BEV – must be left unopened

See later "Charging Section" for information on how to charge and factors that affect SOC

[1] Ford will release BEVs from its production facilities at slightly higher SOCs , and Ship Thrus Upfitters will receive vehicles with minimal to no depletion of SOC beyond these levels. "Topping off" vehicles with some charge may be necessary in certain cases, but charging requirements should be minimal unless vehicles are turned on for long periods of time (especially with A/C or heat in use), taken on test drives, are stored in more extreme hot or cold weather conditions, etc.

2 Drop Ships and Other Entities Performing Pre-Delivery Inspection (PDI)

Storage and Final Processing

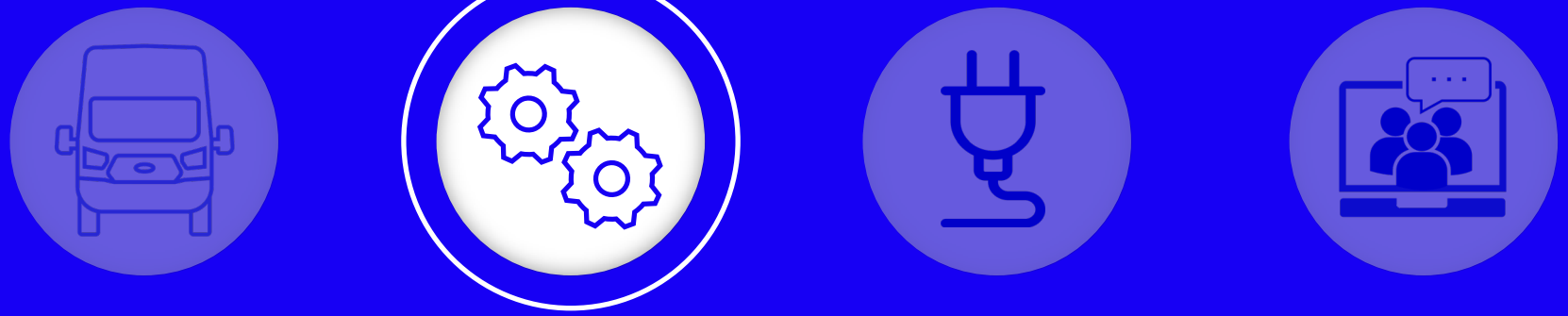
- Prep vehicle in accordance with vehicle-specific PDI checklists as normal
- Prepping vehicle under pre-delivery inspection
  - Charge vehicle to full State of Charge (SOC)
- Factory Mobile Power Cord
  - Belongs to the customer and is NOT TO BE USED in the processing of any BEV – must be left unopened
- PDI checklists can be found at this PTS location (VIN required):

  Ford Motor Company Tech Service
  - Click on the vehicle ID tab, select the model year and vehicle then click the box for “Get Sample Vin” & click "Go“
  - After you click “Go” a VIN will populate. Click “Go” one more time and navigate to the PDI tab; the checklist will be a link under the “PDI” tab
- See later “Charging Section” for information on how to charge and factors that affect SOC
- In instances where vehicle is not immediately being processed, please see table at right for SOC management guidance in different storage timeframes

	If vehicle is not immediately being processed for turnaround and will stay for up to 30 days... (- 30 Days)	If vehicle will see long-term storage: 31+ days (30+ Days)
Keep Vehicle Plugged In?	No	No
High-Voltage Battery State of Charge to Maintain	Keep at SOC level received If < 20% SOC, charge up to 40% SOC until prepping vehicle to leave compound	Keep at 20-40% SOC[1]
Start Vehicle Periodically to Preserve 12V Battery Life?	Not Necessary	Not Necessary
Maintaining High-Voltage Battery SOC Over Long Inactive Periods	No	Disconnect 12V Battery During Storage Period to Avoid Draw on High-Voltage Battery SOC

[1] *To learn how to schedule charging times and set upper limits on the amount of desired charging, please see the appropriate owner’s manual.*

Off Plan Issues



Vehicle Service

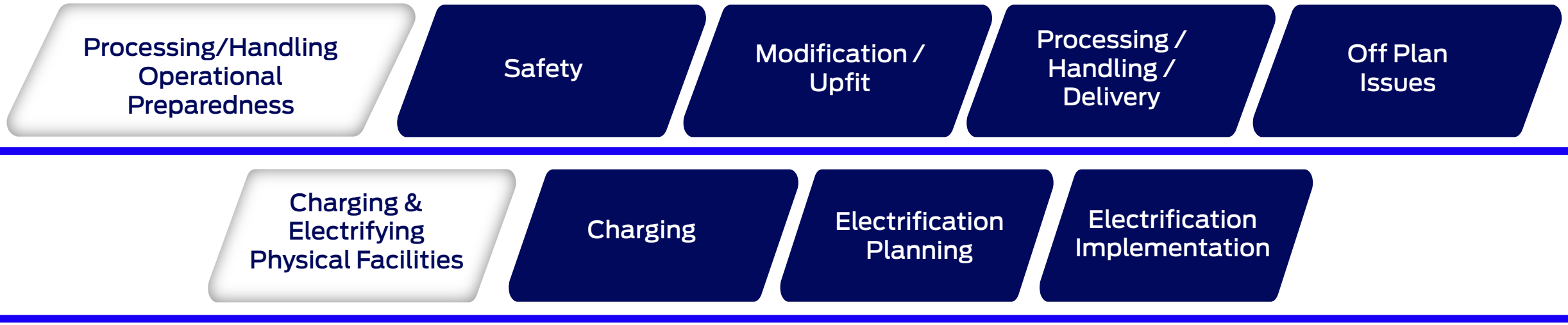
- Service needs should not arise during the upfitting and delivery process or associated storage periods
- However, in the event that any of the following occurs while in your custody
  - Instrument Cluster Warning Lamps appear
  - Vehicle won't start (despite sufficient State of Charge)
  - Other service-related issue

Schedule a service appointment at a local EV-certified dealer

How do I know which dealers are EV-certified?

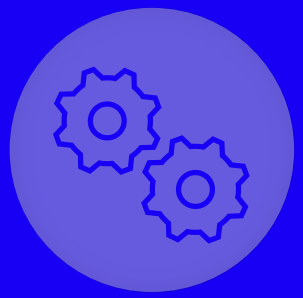
Visit https://www.ford.com/dealerships/

On the "Advanced Search" dropdown, select "EV Certified" before searching in your local area



Becoming “BEV Capable”

Charging



How to Charge the E-Transit and Mustang Mach-E

1 Locate Charge Port

- Open the charge port by pressing the center right-hand edge of the charge port door and then releasing
- Note: Do not apply excessive force. Forcing the door open or closed damages the charge port

2 Review Charge Indicators

a) Power Availability Gauge in the vehicle's instrument cluster (dashboard)

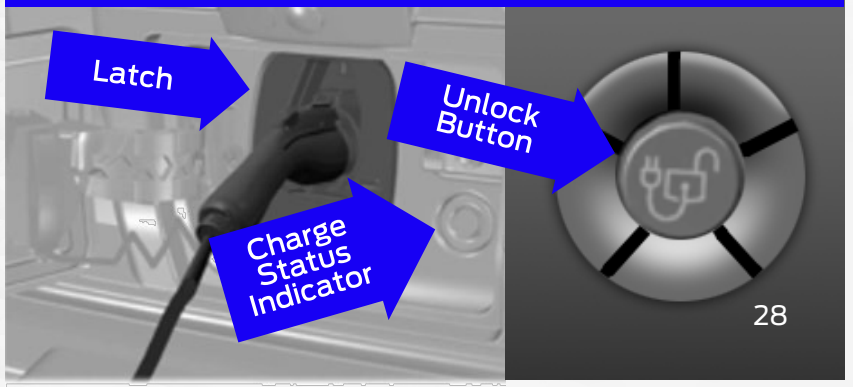
b) Charge status indicator (next to the charging port behind the charge port door) → displays the total available vehicle power

- Divided into five zones, the Charge Status indicator displays the State of Charge (SOC) of the high-voltage battery in 20 percent increments

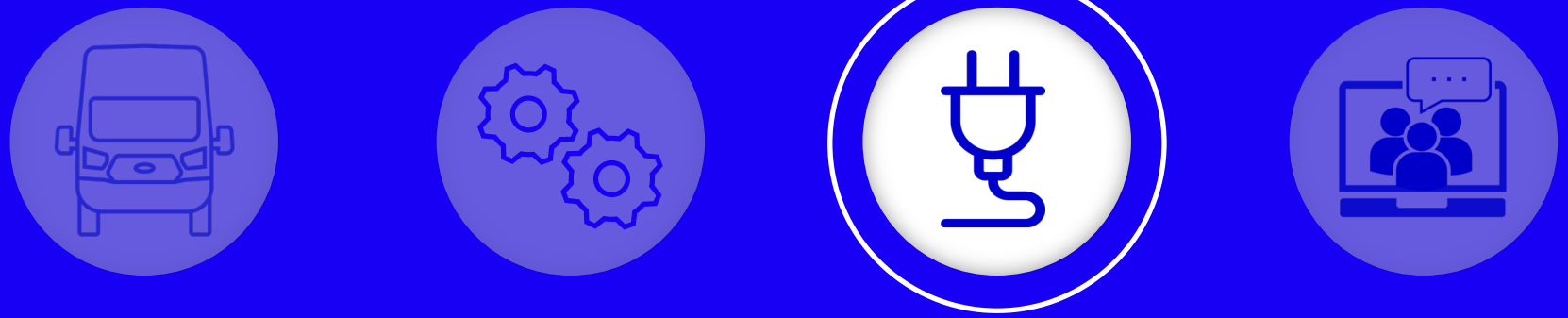
3 Plug in Charge Coupler Handle

- Select the appropriate charge station coupler and plug it into the charge port receptacle of the vehicle
- Make sure the button clicks confirming that you have completely engaged the coupler
- Note: If the Charge Status indicator does not light up or pulse after plugging in, see the vehicle owner's manual for further guidance

IMPORTANT: To safely discontinue charging at any time, Push the coupler unlock button on the Charge Status Indicator. Then press the latch on the charge coupler and remove it from the vehicle charge port.



Electrification Planning



Charging Infrastructure Planning and Installation Necessary

Ship Thru Upfitters and Drop Ship locations will all need to engage in charging up BEVs through normal operations

Ship Thru Upfitters and Drop Ship entities will need to secure their own controlled charging capabilities prior to handling/processing BEVs[1].

To ensure a smooth flow of vehicles and to meet customer expectations at delivery:

1 BEVs destined to Dealers / Drop Ships for further vehicle prep[2]

MUSTANG mach-E → Standard Range Battery → Charge up to 55% State of Charge (SOC) or higher

Extended Range Battery → Charge up to 45% SOC or higher

E-TRANSIT → Charge up to 65% SOC or higher

F-150 LIGHTNING → Standard Range Battery → Charge up to 45% SOC or higher

Extended Range Battery → Charge up to 40% SOC or higher

2 BEVs being prepared by Ship Thru Upfitters or Drop Ship for final pre-delivery inspection (PDI)

All BEVs → Charge up to FULL SOC

[1] See "Implementation" section or "Key Contacts" for how to reach the Ford Pro Charging Sales team with questions about charging infrastructure planning

[2] Exceptions may exist requiring a vehicle to be driven considerable distance to a next destination – in these cases, charging to a higher SOC may be required and will be communicated

Recommended Charging Infrastructure Options

- Given the wide variation in operations and expected level of involvement in BEV order to delivery, Ford wants Ship Thru Upfitters and Drop Ship entities to have the flexibility to define the exact approach(es) to electrification that work best for their facility location(s)

- The following information outlines recommended charging equipment options available and other key information that can assist in defining an approach to facility electrification[1]:

Level 2

Ford Mobile Power Cord with 240V Wall Outlet

A

Level 2

Ford Pro AC Charging Station
240V Hardwired

B

Level 2

Ford
Charge Station Pro
240V/80A

C

Level 3

DC Fast Charge

D

[1] *Ford electric vehicles can charge on any chargers meeting the J1772 industry standard.*

Ford Mobile Power Cord with upgraded 240V/32A wall outlet

Level 2

Ford Mobile Power Cord

State of Charge (SOC) % Provided:

- E-Transit: 0 - 100%: 11 hours
- F-150 Lightning (Standard-Range Battery): 15 - 100%: 14 hours
- F-150 Lightning (Extended-Range Battery): 15 - 100%: 19 hours

Considerations:

- Requires NEMA 14-50 240V outlet to achieve 240V charge times (50-amp GFCI circuit breaker recommended)[1]

Estimated Costs:

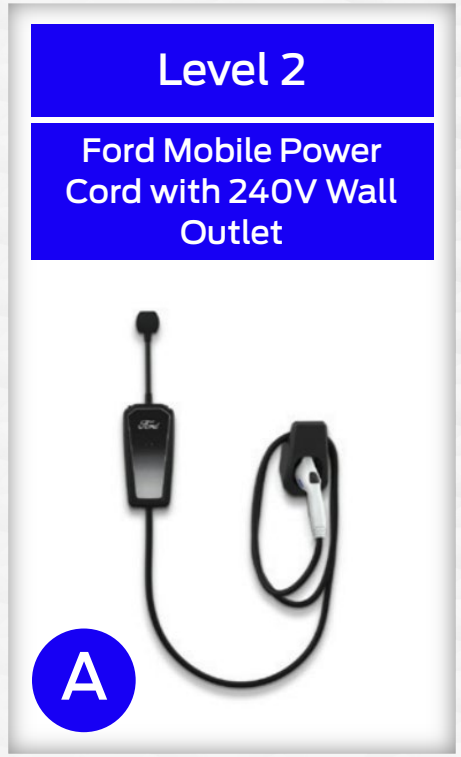
- Hardware: $488.84 MSRP[2]
- Install: ~$3,000 average, $600-$12,700 range[3]

Estimated Lead Time to Install:

- 1-2 months to install 240V, 60A circuit and wire 240V Mobile Power Cord
- Lead times for Mobile Power Cord hardware after purchase will depend on availability

Where to Shop/Buy:

- The Mobile Power cord can be purchased through your local dealer at Parts.ford.com



[1] See "Home Installation Tips for Licensed Electricians" for specific technical specifications.
[2] Prices current as of document publication. Subject to change.
[3] Source for estimated average installation costs: Costs Associated With Non-Residential Electric Vehicle Supply Equipment (energy.gov). Installation costs will vary significantly based on a number of factors, including wiring run length, any need for trenching and available electrical infrastructure.

Ford Pro AC Charging Station (11.5kW) 48A (Wi-Fi and Bluetooth enabled)

State of Charge (SOC) % Provided:

- E-Transit: 0 - 100%: 8 hours
- F-150 Lightning (Standard-Range Battery): 15 - 100%: 10 hours
- F-150 Lightning (Extended-Range Battery): 15 - 100%: 13 hours

Considerations:

- Hardwired charge station requires a 60- amp circuit for full power[1]
- This option has a 3- year limited warranty

Estimated Costs:

- Hardware: $1,099 MSRP[2]
- Install: ~$3,000 average, $600-$12,700 range[3]

Estimated Lead Time to Install:

- 1-2 months to install 240V, 60A circuit and wire 240V Mobile Power Cord
- Lead times for wallbox hardware after purchase will depend on availability

Where to Shop/Buy:

- Contact Ford Pro Charging Team at procharging@ford.com for assistance and guidance

[1] Hardwired charge station requires a 60- amp circuit for full power but can be configured for a lower amperage as well. See "Home Installation Tips for Licensed Electricians" for specific technical specifications.
[2] Prices current as of document publication. Subject to change.
[3] Source for estimated average installation costs: Costs Associated With Non-Residential Electric Vehicle Supply Equipment (energy.gov). Installation costs will vary significantly based on a number of factors, including wiring run length, any need for trenching and available electrical infrastructure.

Level 2

Ford Pro AC Charging Station 48A

Ford Pro AC Charging Station (19.2kW) 80A (Wi-Fi and Bluetooth enabled)

State of Charge (SOC) % Provided:

- E-Transit: 0 - 100%: 8 hours
- F-150 Lightning (Standard-Range Battery): 15 - 100%: 10 hours
- F-150 Lightning (Extended-Range Battery): 15 - 100%: 8 hours

Considerations:

- Hardwired charge station requires a 100-amp circuit for full power[1]
- This option has a 3- year limited warranty

Estimated Costs:

- Hardware: $1,795
- Install: ~$3,000 average, $600-$12,700 range[2]

Estimated Lead Time to Install:

- 1-2 months to install 240V, 100A circuit and wire 240V Mobile Power Cord
- Lead times for wallbox hardware after purchase will depend on availability

Where to Shop/Buy:

- Contact Ford Pro Charging Team at procharging@ford.com for assistance and guidance

Level 2

Ford Pro AC Charging Station 80A

[1] Hardwired charge station requires a 100-amp circuit for full power but can be configured for a lower amperage as well .
[2] Source for estimated average installation costs: Costs Associated With Non-Residential Electric Vehicle Supply Equipment (energy.gov). Installation costs will vary significantly based on a number of factors, including wiring run length, any need for trenching and available electrical infrastructure.

Ford Pro DC Charging Station (60/120kW)*

State of Charge (SOC) % Provided:

- E-Transit: 15-80%: Approx. 34 minutes on a 115 kW DC Fast Charger
- F-150 Lightning (Standard-Range Battery): 15-80%: Approx. 44 minutes on a 150 kW DC Fast Charger
- F-150 Lightning (Extended-Range Battery): 15-80%: Approx. 41 minutes on a 150 kW DC Fast Charger

Considerations:

- Significant capital investment required including potential site upgrades
- Has robust ongoing electrical requirements beyond cost of the equipment

Estimated Costs:

- Please contact Ford Pro Charging Team for hardware options and cost estimates for hardware and installation

Estimated Lead Time to Install:

- 3-12 months, depending on power available on site

Where to Shop/Buy:

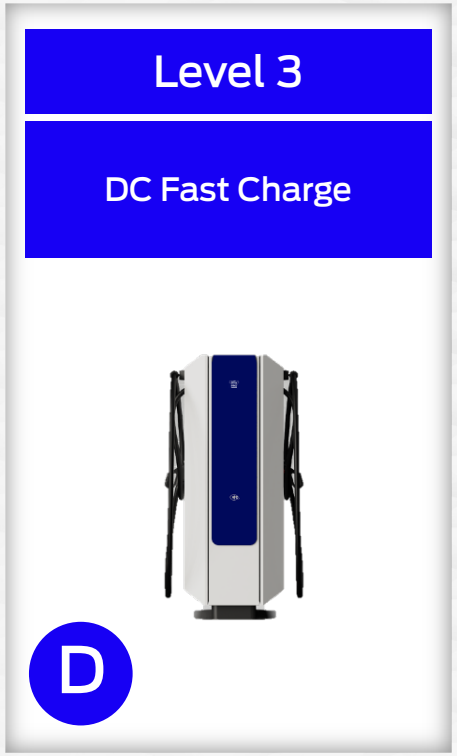
- Contact Ford Pro Charging Team at procharging@ford.com for assistance and guidance

**Not recommended at this time due to high cost*

Will become possible recommendation once a given operation is confirmed to have substantial vehicle throughput with quick processing and turnaround handling needs

Level 3

Ford Pro DC Charging Station*



What type of infrastructure should I get? How many stations do I need?

Main considerations are operational in nature

- Number of vehicles that will need charging[1]
- Expected dwell and turnaround time for vehicles after arriving at the Ship Thru or Drop Ship facility
- Number of vehicles that see long-term storage (which may see drops in their State of Charge (SOC) during this time)

Other considerations that will affect charging operations

Facilities that experience cold and hot weather can see decreased SOC

[1] Beyond initial commercial volume estimates for E-Transit and F-150 Lightning, it is unclear what level of volume a given Ship Thru Upfitter or Drop Ship may see. However, the overall trend will be an increasing of BEV volume, so electrification plans should build in flexibility to scale.

Other factors to consider when planning the electrification of a facility include:

Charging Infrastructure Locations

- Considerations should be made for where it will be most convenient to charge up vehicles (e.g., designated charging area or near where your existing/planned operations will store vehicles)
- Installation costs can vary depending on how far away electric lines are being placed from existing circuits

Planning for Future Volume

- Planning should incorporate long-term electrification time needs[1]
- Electrification plans should have flexibility to scale to avoid future infrastructure tear-ups and unexpected/unnecessary costs

[1] Beyond initial commercial volume estimates for Mustang Mach-E, E-Transit and F-150 Lightning, it is unclear what level of volume a given Ship Thru Upfitter or Drop Ship may see. However, the overall trend will be an increasing of BEV volume, so electrification plans should build in flexibility to scale.

Other Charging Options Not Recommended

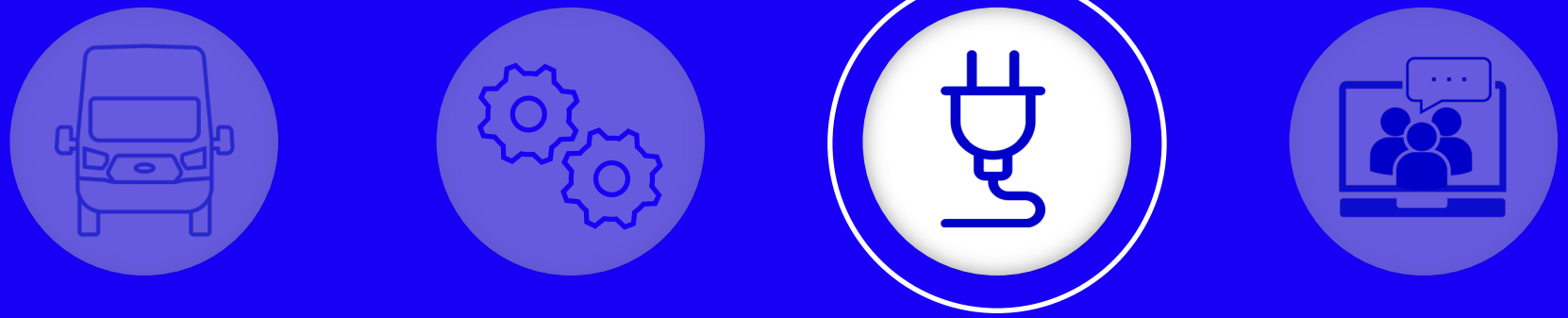
Reference Other Charging Types	Issues & Other Notes
Public Charging	• Public charging availability can be limited depending on your location • Could be leveraged as “emergency charging” backup option when needed
Level 1 (L1) or “Trickle Charging”	• Using a Mobile Power Cord with connector to plug the vehicle into an existing 120V outlet will charge vehicles at very slow rate (bringing to high or full State of Charge (SOC) over the course of days)[1] • Cannot support moderate volume of vehicle throughput or any quick processing turnaround needs • Insufficient and unreliable except as “emergency charging” backup option when needed

Customer’s factory option Mobile Power Cord → NOT TO BE USED & should be kept unopened in “new from factory” condition

Other charging options are NOT RECOMMENDED as they don’t support operational throughput beyond a small-scale level or can’t be relied upon.

[1] For example, L1 “Trickle Charging” can provide ~1.7 miles of range per hour of charging on the E-Transit vs. 11 miles of range per charging hour on the Ford Mobile Power Cord with 240V/32A wall outlet or 15 miles of range per charging hour on the Ford Connected Charge Station 240V/48A presented earlier.

Electrification Implementation



Implementation Considerations

After developing a plan for electrification,
the following considerations may be helpful for implementation

Electricity Rates & Working with Utility Providers

- Work with utility providers early as possible
- Long lead times may be needed for zoning considerations, jurisdictional approvals or installation factors such upgraded or new facility electrical infrastructure or utility service upgrades

Organizational Changes

- Create an organizational interface between facility and operations managers to better share information and more easily work with local utilities in new ways
- This can particularly assist in understanding when/how to scale as BEV volume increases

Environmental Considerations

- Ship Thru Upfitters and Drop Ships wanting to power charging infrastructure and/or facilities with partial or full renewable energy have many options that can also support cost savings and energy conversation
- More details can be found in the Charging Buyer's Guide here

Tax Credits / Cost Offsets

- Purchasing and installing charging equipment can qualify for Federal, state and local tax incentives in some cases
- Various states/provinces provide opportunities to earn carbon credits such as Low Carbon Fuel Systems (LCFS) credits, which can offset installation and operational costs

Ford Pro Charging Team

- The Ford Pro Charging Sales team can assist with questions around developing and implementing facilities electrification plans
- Email them to start a conversation at procharging@ford.com

Resources & Contacts

Web / Document Links	Summary
Vehicle Owner's Manuals	• Detailed guidance for operating BEVs and their features
Body Builder Advisory Service Website	• Information related to the modification of vehicles
• Publications	• Detailed information on vehicles, including Body Builder Layout Books
• Bulletins	• Bulletins of additional guidance/clarification issued by Ford's Special Vehicle Engineering
Fleet.Ford.com Resources	• Vehicle-specific documents related to Modification, Battery Removal, Emergency Response and Vehicle Rescue
Workshop Manual	• Comprehensive manual that contains Ford specified diagnostic and repair procedures as well as critical health and safety precautions • Requires subscription but includes service information including Technical Service Bulletins and Field Service Actions (FSAs/Recalls) for all vehicle lines
Training • No FIN Code Accessible • FIN Code Accessible	• Links to Ford Customer Service Divisions (FCSD) developed training related to safely working on BEVs. Some training may require authenticated accounts
Pre-Delivery Inspection Checklists	• Vehicle-specific lists that detail all aspects of expected vehicle preparation for delivery, available after submitting VIN
Charging Guide	• Customer-oriented guide helping fleets to develop successful plans for establishing charging infrastructure, located on Shopping Tools and Business Resources page
Locating EV-Certified Ford Dealerships	• Website for locating dealerships that can perform service on BEVs. Click on "Advanced Search" to toggle the filter for "EV Certified"

Key Document Links

Contacts	
Body Builder Advisory Service	• 1-877-840-4338 OR 313-748-9080 • For questions Ship Thru Upfitters may have specifically about modifications
Drop Ship – General Inquiry	• fleetwty@ford.com • For questions related to Drop Ships
Ordering Dealer or Fleet Management Company Contact	• For questions related to the customer's needs around the requested upfit or delivery logistics, contact the ordering Ford Dealer or Fleet Management Company
Ford Pro Charging Team	• procharging@ford.com • For questions or to get additional guidance related to charging infrastructure planning and implementation
Ford Pro Contact Center Of Excellence	• 1-800-34-FLEET (35338) • Main contact center for fleets and fleet management companies • Visit the linked page for the various types of assistance can be provided

Key Contact Summary

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